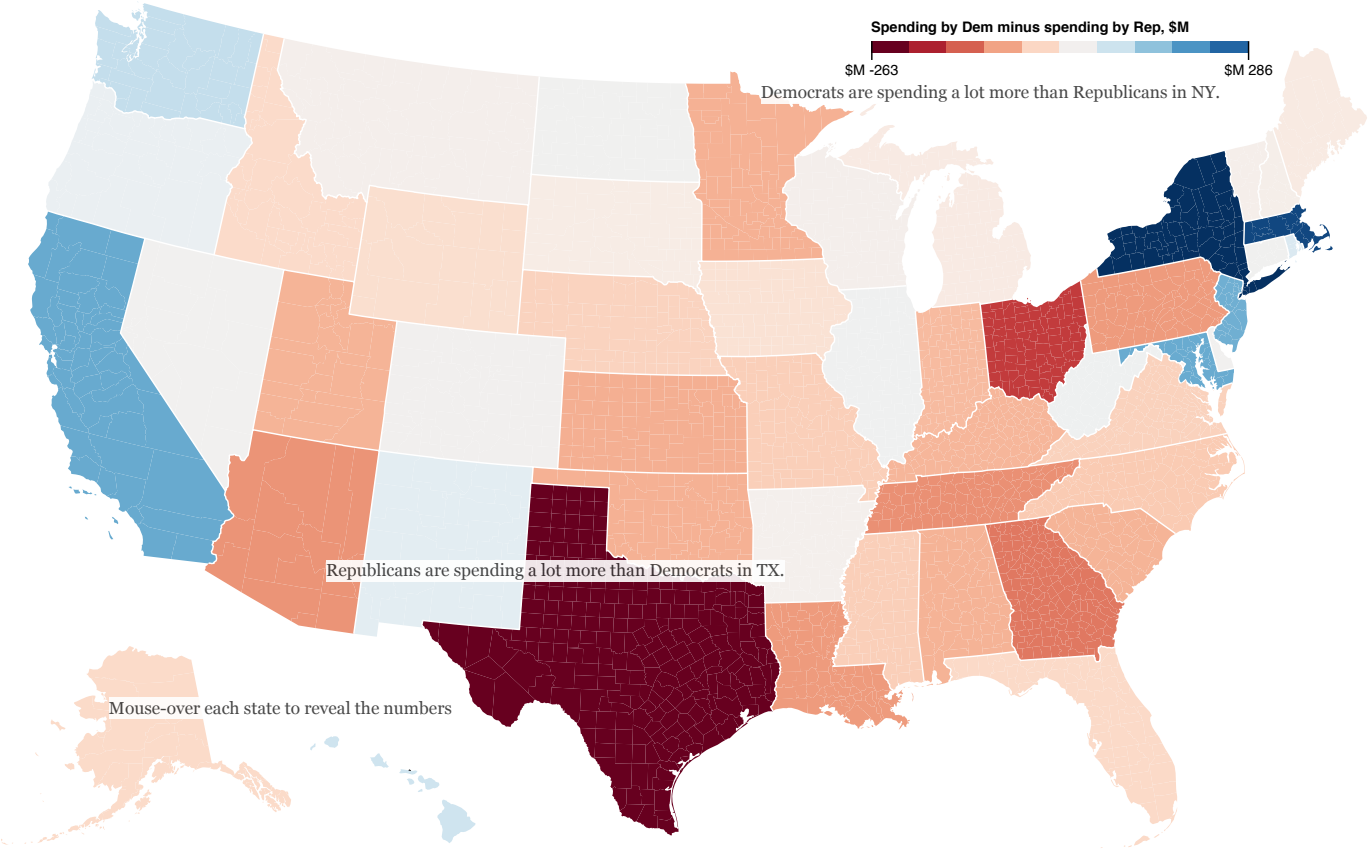
Published: July 29, 2018

US Electoral Process - What Price Victory?

The electoral process in the US costs hundreds of millions of dollars per cycle. Where, when and why is this money spent?

Electoral spending by the two main parties is uneven, with one party often spending more than the other. Using FEC data, we calculate the difference between the total spending by candidates aligned with the Democratic Party and candidates of the Republican Party, by state, between 1996 and 2017. The color of each state on the map correlates with the difference in spending, i.e. Democratic spending minus Republican spending.



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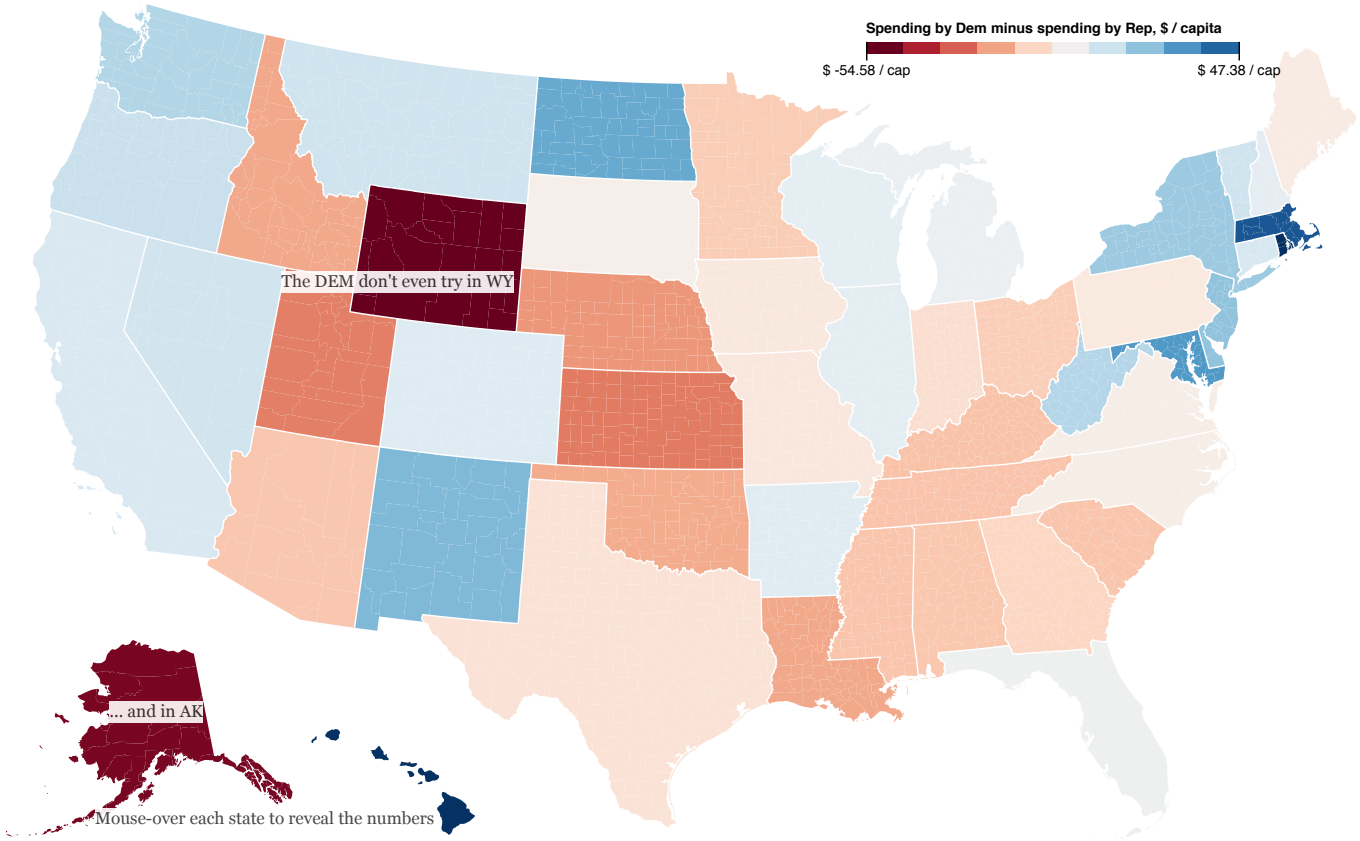
The imbalance in spending between the Democratic and Republican parties, mapped on a per-capita basis by state, using population figures from the 2010 census.

Deep red values (negative numbers) indicate Republican are outspending the Democrats, while deep blue values (positive numbers) indicate the opposite.



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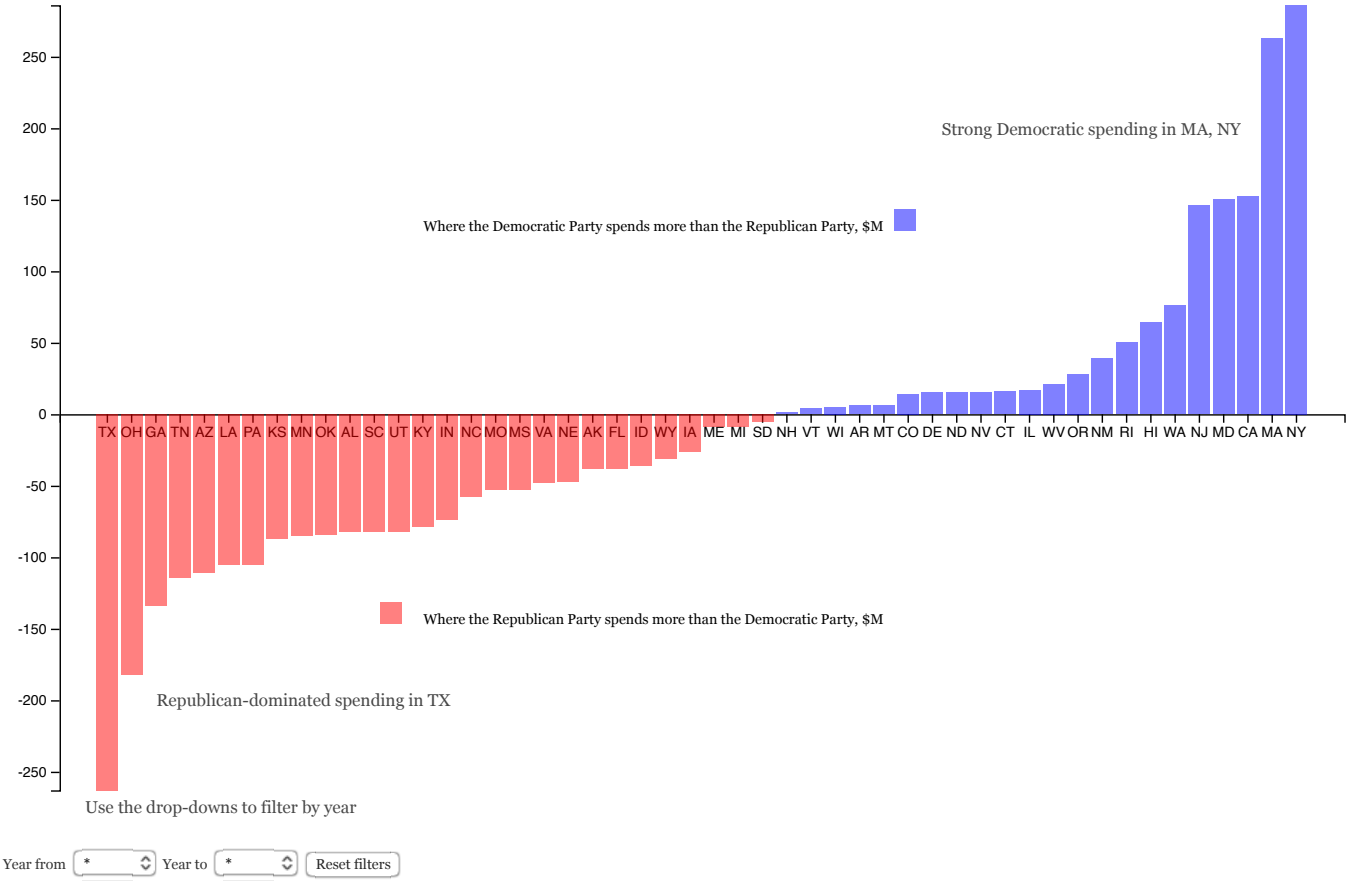
The spending imbalance correlates with the commonly held opinion that some states are reliably Republican or Democratic.

Ordering the states by the spending imbalance can give a measure of polarization.



Use the drop-downs to filter by year

Year from * Year to * Reset filters

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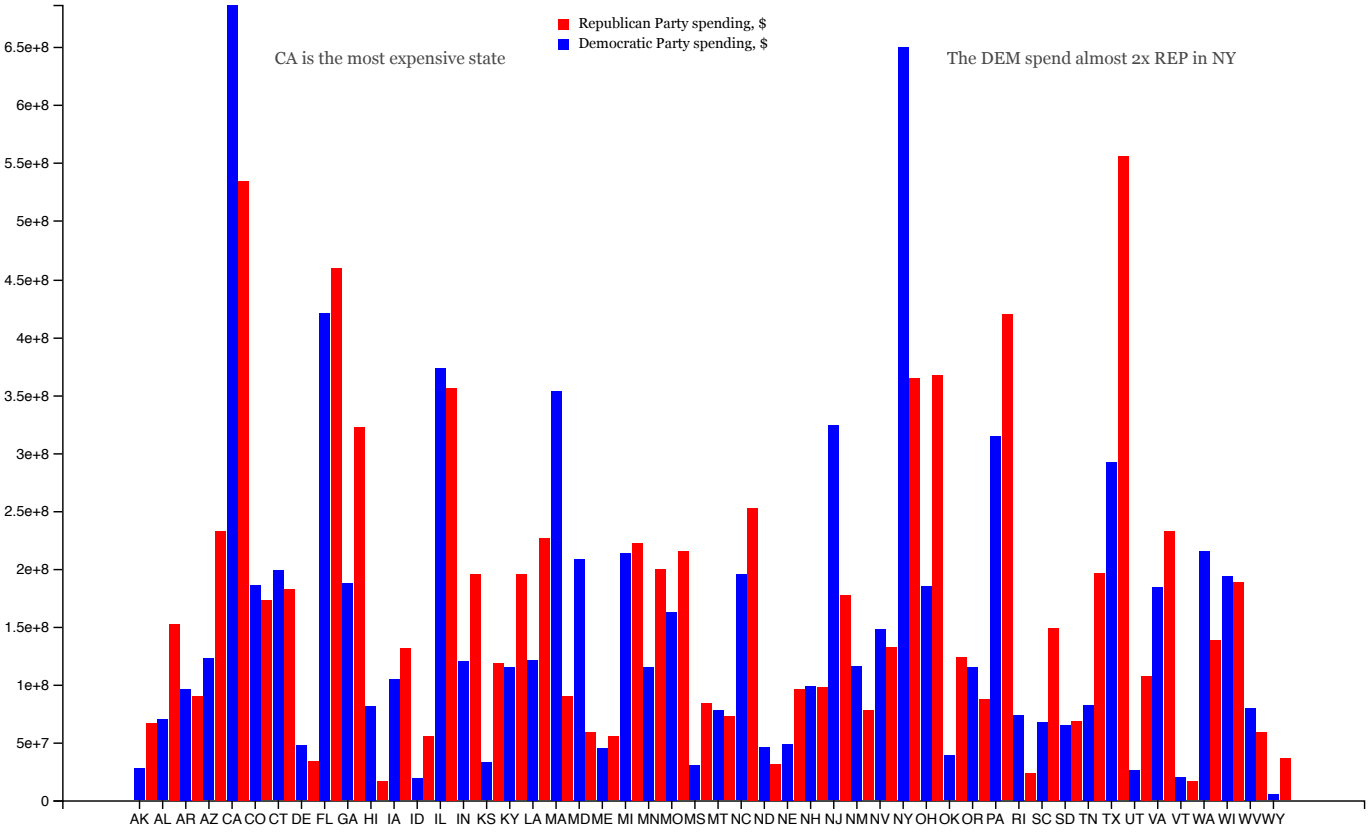
Explore the spending by state, party and year.

Many large states show significant spending imbalances. Many states show unbalanced spending in the odd years, when spending is thin.



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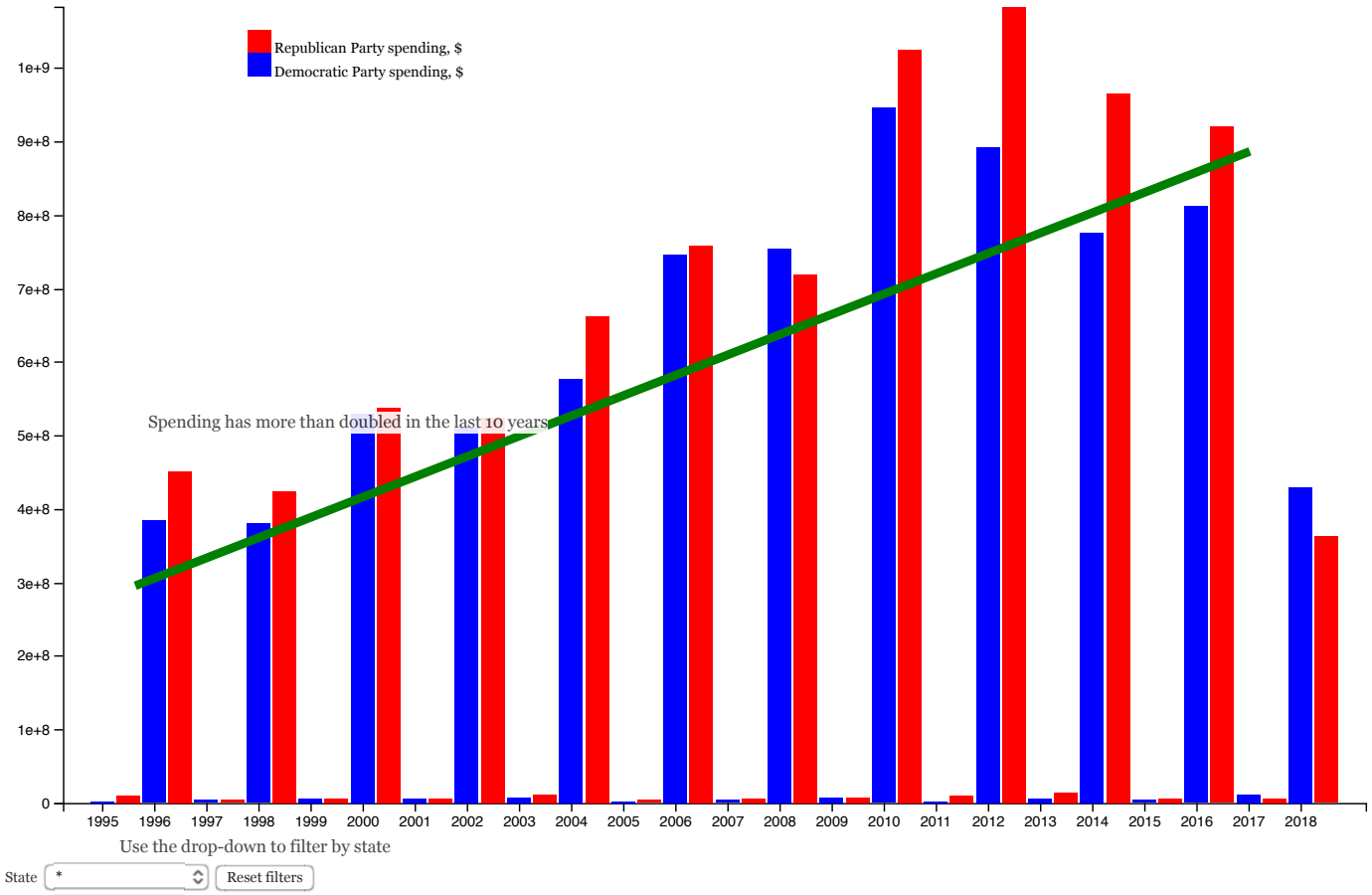
Electoral spending is highly seasonal, with almost no spending on odd years, when there is no election for Congress.

Spending has increased steadily over the last decade, almost doubling.



Use the drop-down to filter by state

State * Reset filters

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Vote share correlates with spending share

Candidates and parties spend abundantly because spending correlates with winning. The correlation is not linear and many candidates overspend.

For races between 1996 and 2006 (1) where we could identify a general election winner and a loser from the two major parties, with spending and final result (% of votes), we are calculating:

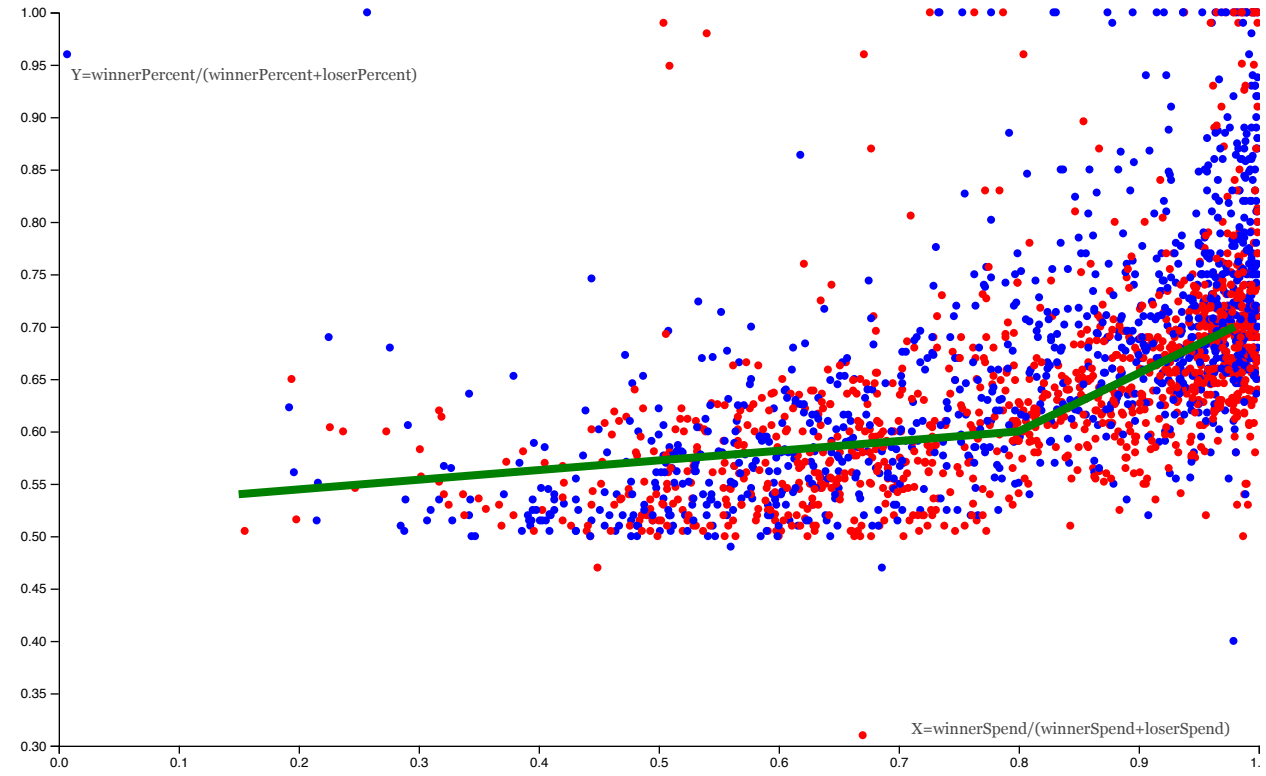
X = winnerSpend / (winnerSpend+loserSpend)

Y = winnerPercent / (winnerPercent+loserPercent)

winnerSpend = total spending by winner;
loserSpend = total spending by loser;

winnerPercent = general election % result for winner.
loserPercent = general election % result for loser.

(1) Data not available after 2006.



Use the drop-downs to filter by party, state or year

Party * State * Year from * Year to * Reset filters

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An exploration of spending in US federal elections inspired by [Cox10]

The multidimensional nature of US campaign spending demands a visual narrative approach capable of allowing the author to guide the reader through the scenes exploring the various aspects of campaign spending and the controls available for reader inquiry. The narrative thread running throughout the article explores the ideas that electoral spending is **uneven by party, state and year**, and that **spending correlates to winning**. The site's hybrid narrative structure, as an **interactive slideshow** [SH10], lends itself to exploration of this complex topic with its combination of author-driven narrative and user-driven inquiry (direct access to data). Using **scenes, annotations, parameters and triggers** to achieve a narrative visualization, the site gives structure to the data, encouraging user formed inquiry and opinion.

The interactive slide show format allows the user to move through the data views at an individually determined rate and in an individually determined order. The scenes are arranged in increasing order of interactivity and data granularity, allowing the user more and more control and access to finer-grained data points. This trend culminates with the "Spending vs outcome" slide, where the user has access to data for individual races and the ability to filter by all the available dimensions (party, state and year). This last scene also conveys the overall conclusion of the narrative: spending correlates with success.

The **scenes** are organized around charts, each showing a different aspect of US federal electoral spending. A stepper button encourages the user to move through the scenes in a linear fashion. The scenes can also be accessed also in random order, allowing the user to determine the desired pace for data exploration (like in [COX10]). Highlighted tabs in the navigation bar allow the user to remain oriented within the slide show. Data visualization is featured prominently on each page, occupying the largest area and focusing the reader's attention. The title and story summary are constant in content and location, anchoring semantic context for the narrative. The site is built on a single HTML frame, providing **visual consistency** through single-frame interactivity.

Each scene includes a data-related observation on the left of the page and **annotations** related to the visualization, and its interactive elements. All annotations are created using the same template (DIV element + CSS styling), providing **visual consistency**. Some annotations highlight data items such as extreme data points, while others discuss trends or draw conclusions from the data. Whenever the data are not filtered, there is an annotation at the bottom of each page that encourages the user to interact with the available data exploration options. Two charts display trend lines as a form of data annotation, but only when the full data set is in view. Annotations are **cleared** on each page change, and every time the data are filtered, because they are semantically tied to the full data set. Tooltips are available at all times.

Many aspects of the visualization are controlled by **parameters**, of which the most important is the page number. The page number is used as a key in a map of structures containing other parameters. Changing the page number changes the chart key message, the annotations' text and position, and the commentary displayed to the left of the chart. The party, state and year filter parameters allow filtering the data by the chosen parameter combination. Filters defaults to 'All' and are reset on page changes. The page number plus the user-chosen data filtering criteria fully determine the **state** of the visualization.

The main **trigger** is the page selector, invoked from the page change buttons. Each button press calls a JavaScript function that changes the page number, clears the current page and renders the new page. Changing the page number causes changes in the chart being displayed, the underlying data set, the annotations, left side message. Choosing a party, state or year from the drop-downs filters the population in the scatter plot by setting filter parameters. The year range parameters must always satisfy the precedence relationship ("from" before "to") and the change triggers enforce this codependency. Uniformly located and styled annotations phase in after the page loads and inform the user of the available user events in each scene.

Through the user interface, actions are attached to **events** such as button presses, mouse in/out, drop-down choices. An annotation on the first two pages alert the user to the availability of mouseover events throughout the visualization. Every page thereafter features an annotation calling attention to the available interactivity options (data filtering). Button click events are used to change the page number. Mouse hover events trigger the display (on mouse-in) and removal (on mouse-out) of tooltips, showing details-on-demand. The change of value in any drop-down triggers the filtering of the data and a redraw event. The party, state and year drop-downs are each visible when and only when they are applicable.

Note: Pages 3-7 use **only D3 v4**. The maps also use D3 scale-chromatic and D3 topojson.
Ref:

[SH10] SEGEL, E., HEER J.: Narrative visualization: Telling stories with data. IEEE Trans. on Visualization and Computer Graphics 16, 6 (2010), 1139–1148.
[Cox10] COX A.: Budget Forecasts vs. Reality , 2010.
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